



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,997	04/02/2004	Yih-Jen Dennis Chen	K35A1426	1992

35219 7590 04/12/2005

WESTERN DIGITAL TECHNOLOGIES, INC.
20511 LAKE FOREST DR. -C205
LAKE FOREST, CA 92630

EXAMINER

HABERMEHL, JAMES LEE

ART UNIT	PAPER NUMBER
----------	--------------

2651

DATE MAILED: 04/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/816,997	Applicant(s) CHEN ET AL.	
	Examiner James L Habermehl	Art Unit 2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-14 and 16-18 is/are rejected.
- 7) ☒ Claim(s) 6 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2 Apr 04</u> . | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2651

1. This Office action is in response to application papers filed 2 April 2004, which papers have been placed of record in the file.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-5, 9-14, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Koganezawa. Koganezawa Figures 3A-3B and 6A-11 meet all the limitations of claims 1-3 and 10-12, including a primary actuator comprising a voice coil motor (102), first and second secondary actuators comprising a piezoelectric element (230), a servo controller (250) for generating a first control signal (251) applied to the first secondary actuator and phase shifting the first control signal by a predetermined phase to generate a second control signal (251) applied to a second secondary actuator.

Regarding claims 4-5 and 13-14, Figures 3A and 6A show first and second suspensions (208-2A, 208-2B) and first and second secondary actuators (230-2A, 230-2B) as claimed.

Regarding claims 9 and 18, Figure 7 shows the predetermined phase is approximately zero degrees to attenuate excitation of an arm sway mode.

Art Unit: 2651

4. Claims 1-5, 9-14, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Ell et al. Ell et al. Figures 2 and 4-6 meet all the limitations of claims 1-3 and 10-12, including a primary actuator comprising a voice coil motor (192/194), first and second secondary actuators comprising a piezoelectric element (431/441 and 432/442, 621 and 622), a servo controller (420/600) for generating a first control signal (419/601) applied to the first secondary actuator and phase shifting the first control signal by a predetermined phase to generate a second control signal (419/601) applied to a second secondary actuator.

Regarding claims 4-5 and 13-14, Figure 4 show first and second suspensions (421, 422) and first and second secondary actuators (431/441 and 432/442) as claimed.

Regarding claims 9 and 18, col. 5, lines 52-59 show the same control signals are sent to both the first and second secondary actuators, and hence the predetermined phase is approximately zero degrees to attenuate excitation of an arm sway mode.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koganezawa in view of Shiraishi et al. Koganezawa Figures 3A-3B and 6A-11 meet all the limitations of claims 7 and 16 for the reasons given above regarding claims 1 and 10, except it does not show a first mounting bracket for mounting the first head, a second mounting bracket for mounting the second head, a first suspension comprising a distal end coupled to the first mounting bracket, and a second suspension comprising a distal end coupled to the second mounting bracket, wherein the first secondary actuator applies an actuating force to the first mounting bracket and the second secondary actuator applies an actuating force to the second mounting bracket.

Shiraishi et al. Figures 1-3, 5, and 7 show a first mounting bracket (22) for mounting the first head (21), a second mounting bracket (22) for mounting the second head (21), a first suspension (24) comprising a distal end coupled to the first mounting bracket, and a second suspension (24) comprising a distal end coupled to the second mounting bracket, wherein the first secondary actuator (51/52) applies an actuating force to the first mounting bracket and the second secondary actuator (51/52) applies an actuating force to the second mounting bracket. Koganezawa col. 1, lines 48-53 show that a plurality of piezoelectric micro-actuator head driving devices are known in the art, and that head suspension drive and slider drive microactuators are main types of microactuators and therefore are equivalent structures known in the art of micro-actuator positioning of the head. Therefore, because these two micro-actuators were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute the micro-actuator disclosed by Shiraishi et al. for the micro-actuator disclosed by Koganezawa.

7. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ell et al. in view of Koganezawa. Ell et al. meets all the limitations of claims 8 and 17, including showing a predetermined phase to attenuate excitation of an arm torsion mode by moving first and second secondary actuators 621 and 622 in the same direction, except it does not show the predetermined phase is 180 degrees. Rather, it shows using a predetermined phase of zero degrees. Koganezawa Figures 7-8 show that secondary actuators arranged such that the piezoelectric microactuators displace in opposite directions given the same control signal input and secondary actuators arranged such that the piezoelectric microactuators displace in the same direction given the same control signal input are known in the art. Figures 7-8 further show that the control signal for one microactuator arrangement must be inverted, which is changed in phase by 180 degrees, in order to achieve the equivalent movement direction in the other microactuator arrangement, and therefore are equivalent structures known in the art of micro-actuator positioning of the head. Therefore, because these two micro-actuators, and their concomitant inverting of the control signal phase if one is substituted for the other, were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to use a secondary actuator arrangement using a predetermined phase of 180 degrees to attenuate excitation of an arm torsion mode instead of the secondary actuator using zero degrees to attenuate excitation of an arm torsion mode.

8. Claims 6 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim

Art Unit: 2651

and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

Claims 6 and 15 are allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a disk drive and a method of attenuating excitation of at least one arm vibration mode in a disk drive comprising the second secondary actuator is coupled to a second side of the actuator arm, and a second linkage extends along the second side of the actuator arm and couples the second secondary actuator to the second suspension, as presented in the environment of claims 6 and 15. It is noted that the closest prior art, Murphy, shows the first secondary actuator is coupled to a first side of the actuator arm, and a first linkage extends along the first side of the actuator arm and couples the first secondary actuator to the first suspension. However, Murphy fails to disclose the second secondary actuator is coupled to a second side of the actuator arm, and a second linkage extends along the second side of the actuator arm and couples the second secondary actuator to the second suspension as claimed.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Goodman et al. Figures 1-2 and Masuda et al. Figures 1 and 5-7 also show phase shifting the first control signal to generate a second control signal to attenuate an arm vibration mode. Price Figures 4-6, Morris et al. Figures 5-8, Morioka Figures 13-14, Yoshikawa et al. Figures 6-13 and 18-19, Huang et al. shows attenuating arm vibration modes.

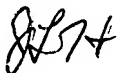
Art Unit: 2651

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James L Habermehl whose telephone number is (571)272-7556.

The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571)272-7843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Habermehl/jlh
7 Apr 05



DAVID HUDSPETH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600